APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,312	12/11/2001	Javad Razavilar	70690	3211

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EXAMINER
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ART UNIT	PAPER NUMBER
2681	3

DATE MAILED: 07/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.		Applicant(s)	
Office Action Summary		10/014,312		RAZAVILAR ET AL.	
		Examiner		Art Unit	
		Huy D Nguyen		2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>11 December 2001</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-13 and 17-23* is/are rejected.

7)☒ Claim(s) *3-5 and 14-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>2</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-2, 6-13, 17-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Warren et al. (U.S. Patent No. 5,912,921) in view of Valkealahti (U.S. Patent Application

Publication No. US 2002/0128031).

Regarding claims 1-2, 11-13, 21-23 Warren et al. teaches a method of rate control

between a first communication terminal and one or more remote communication terminals of a

communication system, the method comprising: receiving, at each of the one or more remote

communication terminals, a respective signal modulated using a respective one of a plurality of

rates from the first communication terminal via a respective forward channel, wherein each

communication terminal is capable of supporting communications using the plurality of rates;

and determining a respective optimal one of the plurality of rates to be used by the first

communication terminal for a respective subsequent signal to be transmitted to each of the one or

more remote communication terminals based upon a respective maximization of the throughput

to each of the one or more remote communication terminals given a respective channel state of

each respective forward channel (col. 2, lines 60-67, col. 3, lines 1-15). Warren et al. does not

mention about the cost function. Valkealahti teaches a method for power and bit rate selection to

minimize the cost function ([0005], [0006], [0016], [0018]). It would have been obvious to one

of ordinary skill in the art, at the time of the invention, to apply the teaching of Valkealahti to the

teaching of Warren et al. to minimize the cost function.

Regarding claims 6, 18-19, Warren et al. teaches method of claim 1 further comprising

establishing the respective forward channel and a respective reverse channel between the first

communication terminal and each of the one or more remote communication terminals (Fig. 1 &

4; col. 4, lines 45-67, col. 5, lines1-3).

Regarding claims 7 and 17, Valkealahti teaches method of claim 1 further comprising

determining the respective channel state of the respective forward channel between the first

communication terminal and each of the one or more remote communication terminals, the

respective channel state based upon a respective measured signal-to-interference ratio

corresponding to the respective received signal ([0032], [0033]).

Regarding claim 8, Warren et al. teaches method of claim 1 further comprising

transmitting a respective rate update message to the first communication terminal from each of

the one or more remote communication terminals, each respective rate update message indicating

the respective optimal one of the plurality of rates to be used by the first communication terminal

for the respective subsequent signal (col. 5, lines 53-62).

Regarding claim 9, Warren et al. teaches method of claim 1 further comprising saving the

respective optimal one of the plurality of rates to be used by the first communication terminal for

the respective subsequent signal in memory (col. 2, lines 66-67; col. 5, line 61).

Regarding claims 10 and 20, Warren et al. teaches method of claim 1 wherein the

determining step is performed at each of the one or more remote communication terminals (col.

3, lines 6-9).

Allowable Subject Matter

3.   Claims 3-5, 14-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 3, 14, the combination of Warren et al. and Valkealahti fails to teach method of claim 2 wherein the determining, for each of the determining the respective optimal one step, the respective cost functions step comprises: determining, for each of the determining the respective optimal one step, respective cost functions associated with arriving at a system state using the respective one of the plurality of rates from previous system states using each of the plurality of rates, each of the respective cost functions being a function of the throughput to a respective one of each of the one or more remote communication terminals and the cost associated with the change in rate; wherein the selecting, for each determining the respective optimal one step, the respective optimal cost function comprises: selecting, for each determining the respective optimal one step, the respective optimal cost function from the respective cost functions, the respective optimal cost function providing an optimal one of the plurality of rates used in arriving to the system state using the respective one of the plurality of rates; and equating the optimal one of the plurality of rates used in arriving to the system state to the respective optimal one of the plurality of rates to be used by the first communication terminal for the subsequent signal.

Regarding claims 4-5, 15-16, the combination of Warren et al. and Valkealahti fails to teach method of claim 2 further comprising solving, for each of the one or more remote

communication terminals, the following equation to perform the determining, for each

determining the respective optimal one step, the respective cost function step and the selecting,

for each determining the respective optimal one step, the optimal cost function step: 9 V n (s n ,

r n) = max u { 1 , 2 , , L } { R (s n , r n , u) + V n - 1 (s n , u) } where V.sub.n(s.sub.n,r.sub.n)

is the respective optimal cost function for the n.sup.th iteration, s.sub.n is a current channel state

of the respective forward channel corresponding to the respective received signal, r.sub.n is the

respective one of the plurality of L rates that the respective received signal is modulated with, u

assumes any possible value of the plurality of L rates for the rate r.sub.n+1, r.sub.n+1 is the

respective optimal one of the plurality of L rates to be used by the first communication terminal

for the respective subsequent signal, .beta. is a discount factor, V.sub.n-1(s.sub.n,u) is the

respective optimal cost function for iteration n-1, and R(s.sub.n,r.sub.n,u) is a cost-per-stage

function given by: 10 R (s n , r n , u) = { T (r n , s n) if u = r n C + T (u , s n) if u r n where

T(r.sub.n,s.sub.n) is the throughput to a respective one of the one or more remote communication

terminals when rate r.sub.n is used for r.sub.n+1 given channel state s.sub.n, T(u,s.sub.n) is the

throughput to the respective one of the one or more remote communication terminals when rate u

is used for r.sub.n+1 given channel state s.sub.n, and C is the cost associated with the change in

rate, where C<0.

Conclusion

4.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

-      Snowden et al. (U.S. Patent No. 5,974,032).

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huy D Nguyen whose telephone number is 703-305-3283. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Erika A Gary can be reached on 703-308-0123. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

06/23/04

ERIKA GARY
PATENT EXAMINER